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The Effect of Dietary Palm Kernel Cake on Body Fat and Carcass of Barrows

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ABSTRACT: This study was conducted to investigate the effect of dietary palm kernel cake on body fat and carcass of barrows. Thirty six (36) Australian Landrace barrows at 30 weeks old with average weight of 65.66±2.70 kg were used in four dietary treatments, i.e., the P_1, P_2, P_3 and P_4. The feeding trial was carried out from 30 up to 36 weeks old by using two diets, i.e., R_1 (commercial diet) and R_2 (diet containing palm kernel cake). The P_1 group was fed with R_1 during the whole trial. The P_2 was fed with R_1 during the first four weeks and fed with R_2 during the last two weeks. The P_3 was fed with R_1 during the first two weeks and fed with R_2 during the last four weeks. The P_4 was fed with R_2 during the whole trial. The results showed that dietary treatments P_1, P_2, P_3 and P_4 did not significantly influence abdominal fat and percentage of abdominal fat weights, iodine number of back fat, carcass and the percentage of carcass bone weights, and the carcass meat weight. But, significantly decreased thickness of back fat, and increased the firmness of back fat and the percentage of carcass meat weight ($P<0.05$). The thinnest back fat, the highest firmness back fat and percentage of carcass meat weight were all found in the dietary treatment of P_4 group.

Key Words : Commercial Diet, Palm Kernel Cake, Barrow, Body Fat, Carcass.

Introduction

Pig bring fed with high unsaturated fatty acids tend to produce a soft fat (Parakkasi, 1983). One of the swine-stocker at Tabanan Bali explained that very oten carcass fat being produced was soft, because the diet (commercial diet) was composed of 10% growing-finishing pig concentrate, 45% ground yellow corn and 45% rice bran. As reported by Bo Gohl (1981) maize utilization in the pig diet should be restricted, because the highly unsaturated fat in maize may produce a soft fat if maize is included at high levels. Likewise, rice bran should not also exceed 30- 40% of the total ration to avoid soft fat. In the final weeks of fattening, lower levels of rice bran must be used.

Pond and Maner (1984) showed that sun-dried cassava meal as energy source can be utilized to replace maize in growing-finishing pig diets. Utilization levels of 20 and 40% sun-dried cassava meal in a similar quantity of maize resulted similar growth-rate and feed efficiency. Aritonang (1986) reported that palm kernel cake is good enough as energy and protein sources, in spite of low containing amino acids, i.e., lysine, threonine and methionine. Thus, the using of palm kernel cake in the diet must be supplemented with other protein source as it was soy bean oil meal. On the other hand, Bo Gohl (1981) reported that palm kernel cake or meal tend to produce firm fat of good quality. Good results have been obtained from pig diets consisting of 20-30% palm kernel cake.

The objective of this study was to investigate the effect of dietary palm kernel cake on body fat and carcass status of pigs.

Experimental Procedurs

General. Thirty six (36) Australian Landrace barrows at 30 weeks old with average weight of 65.66±2.70 kg were used in this experiment. The barrows were housed in a collony pen equiped with a feeder and an automatic water fount. All the barrows were randomly and equally distributed to four dietary treatments. Each treatment was replicated three times with three barrows per replicate and were arranged in a completely randomized design (CRD). There were two diets, i.e., R_1 (10% growing-finishing pig concentrate, 45% ground yellow corn, 45% rice bran) such the commercial diet and R_2 (10% growing-finishing pig concentrate,

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Table 1. Composition of commercial diet (R_1) and diet containing palm kernel cake (R_2)

Ingredients	Diets	
	R_1	R_2
	---------- % -------	
Growing-finishing pig concentrate	10	10
Ground yellow corn	45	0
Rice bran	45	27
Dried cassava meal	0	33
Soybean oil meal	0	8
Palm kernel cake	0	22
Total	100	100
Analyzed composition [a]		
Crude protein, %	12.46	13.24
Extract ether, %	6.35	6.50
Crude fiber, %	10.27	10.17
Nitrogen free extract, %	63.35	62.40
Ash, %	7.57	7.64
Calcium, %	2.16	2.47
Phosporus, % total	1.02	0.85
Calculated composition [b]		
ME, kcal/kg diet	3,045	3,052

[a] Kamal (1993)
[b] Parakkasi (1983), Aritonang (1986) and Anonymous (—).

27% rice bran, 33% dried cassava meal, 8% soybean oil meal, 22% palm kernel cake) such the diet containing palm kernel cake (Table 1).

The period of the feeding trial was six weeks (30-36 weeks old). The four dietary treatments were P_1, P_2, P_3 and P_4. The P_1 was fed with R_1 during the whole trial. The P_2 was fed with R_1 during the first four weeks and fed with R_2 during the last two weeks. The P_3 was fed with R_1 during the first two weeks, and fed with R_2 during the last four weeks. The P_4 was fed with R_2 during the whole trial. The diet and the drinking water were given *ad libitum*. At the termination of feeding trial, the pigs were slaughtered to investigate the body fat status (the abdominal fat and the percentage of abdominal fat weights, the thickness and the firmness of back fats, the iodine number of the back fat), and the carcass status (the carcass and the percentage of carcass weights, the carcass meat and the percentage of carcass meat weights, the carcass bone and the percentage of carcass bone weights). The iodine number of back fat was determined according to Sudarmadji, et al. (1984).

Statistical analyses. Data on body fat and carcass were analyzed using the analysis of variance in completely randomized design and Duncan's multiple range test was used if the analysis of the variance indicated significant differences (Gomez and Gomez, 1984).

Results and Discussion

Body fat. The effect of dietary treatments (P_1, P_2, P_3 and P_4) on body fat status of barrows which consisted of the abdominal fat weight, the percentage of abdominal fat weight, the thickness of back fat,

the firmness of back fat and the iodine number of back fat are shown in Table 2.

Abdominal fat and percentage of abdominal fat weights, and iodine number were not significantly affected by dietary palm kernel cake. But, palm kernel cake significantly decreased the thickness and increased the firmness of back fats ($P<0.05$). The smallest thickness value (3.55 cm) was obtained with barows on dietary treatment of P_4, although did not significant differences with the dietary treatment of P_3(3.73 cm). Those values were greater than 3.33 cm as reported by Bundy *et al.* (1976). Similarly, the highest firmness back fat (5.37 kg/cm^2) was observed with barrows on dietary treatment of P4, and also did not significant differences with the dietary treatment of P_3 (5.34 kg/cm^2). Decreasing thickness may be caused by increasing the firmness of the back fat. The thickness of back fat represents the quality of carcass (Morgan and Lewis, 1962).

Carcass. The effects of dietary treatments (P_1, P_2, P_3 and P_4) on carcass status of barrows which consist of the carcass weight, the percentage of carcass weight, the carcass meat weight, the percentage of carcass meat weight, the carcass bone weight and the percentage of carcass bone weight are shown in Table 3.

Table 2. Body fat of barrows at 36 weeks old fed dietary treatments (P_1, P_2, P_3 and P_4) for a six weeks period (from 30 to 36 weeks old)

	Dietary Treatments			
	P_1	P_2	P_3	P_4
Abdominal fat weight, kg/kcal	2.33	1.73	2.13	1.80
Abdominal fat weight, % of CW	3.14	2.32	2.85	2.52
Thickness of back fat, cm	4.08^{bc}	4.30^{c}	3.73^{ab}	3.55^{a}
Firmness of back fat, kg/cm^2	4.67^{a}	4.86^{ab}	5.34^{bc}	5.37^{c}
Iodine number of back fat	41.31	42.01	38.23	41.92

CW : carcass weight

a,b,c Means within a row with different superscripts are significantly different ($P<0.05$).

Table 3. Carcass of barrows at 36 weeks of age fed dietary treatments (P_1, P_2, P_3 and P_4) for a six weeks period (from 30 to 36 weeks old)

Items	Dietary treatments			
	P_1	P_2	P_3	P_4
Body weight, kg/head	94.66	97.33	97.23	96.00
Carcass weight, kg/head	73.83	74.26	74.41	71.10
Carcass weight, % of BW	78.07	76.29	76.46	74.01
Carcass bone weight, kg/head	9.80	10.66	10.13	9.93
Carcass bone weight, % of CW	13.28	14.38	13.74	13.95
Carcass meat weight, kg/head	37.27	36.81	38.74	37.46
Carcass meat weight, % of CW	50.49^{ab}	49.57^{a}	52.08b^{c}	52.74^{c}

BW : body weight

CW : carcass weight

a, b, c Means within a row with different superscripts are significantly different ($P<0.05$).

The carcass and the percentage of carcass weights, carcass bone and the percentage of carcass bone weights, and the carcass meat weight were not significantly affected by dietary palm kernel cake. But, palm kernel cake significantly increased ($P<0.05$) the percentage of carcass meat weight (52.74%) as was shown by barrows on dietary treatment of P_4, although did not significantly differences with the dietary treatment of P_3 (52.08%).

The insignificantcy of those differences were caused by the insignificancy of live weight (Pond and Maneri, 1984), while the significant differences in percentage of carcass meat weight were caused by mainly by the amount of protein being consumed (Canha, 1977).

Implications

Replacement of commercial diet by diet containing palm kernel cake for barrows during the last six weeks before slaughtering (30-36 weeks old) decreased the thickness and increased the firmness of back fats. And the percentage (30-36 weeks old) weight will also be increased.

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